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accordance with Art. 76 EPC:  
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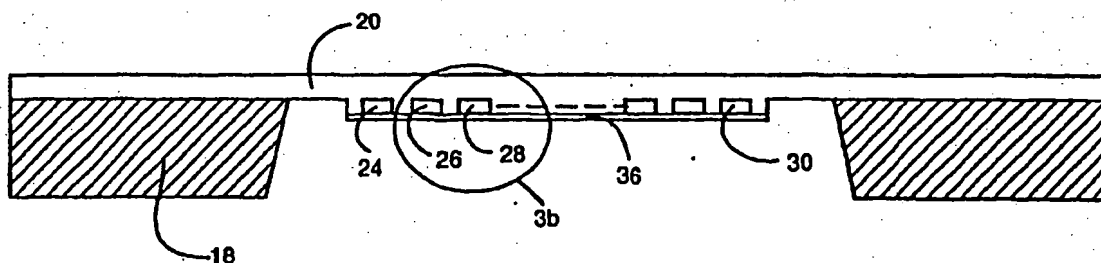
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(54) **Membrane dielectric isolation ic fabrication**

(57) General purpose methods for the fabrication of integrated circuits (24, 26, 28, ... 30) from flexible membranes (20, 36) formed of very thin low stress dielectric materials, such as silicon dioxide or silicon nitride, and semiconductor layers. Semiconductor device (24, 26, 28, ... 30) are formed in a semiconductor layer of the membrane (36). The semiconductor membrane layer (36) is initially formed from a substrate (18) of standard thickness, and all but a thin surface layer of substrate is then etched or polished away. In another version, the

flexible membrane is used as support and electrical interconnect for conventional integrated circuit die bonded thereto, with the interconnect formed in multiple layers in the membrane. Multiple die can be connected to one such membrane which is then packaged as a multichip module. Other applications are based on (circuit) membrane processing for bipolar and MOSFET transistor fabrication, low impedance conductor interconnecting fabrication, flat panel displays, maskless (direct write) lithography, and 3D IC fabrication.



**Fig\_3a**



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## EUROPEAN SEARCH REPORT

Application Number  
EP 02 00 9643

| DOCUMENTS CONSIDERED TO BE RELEVANT                                                                                                                                                                                   |                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                       |                                                |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| Category                                                                                                                                                                                                              | Citation of document with indication, where appropriate, of relevant passages                                                                                                                                                                             | Relevant to claim                                                                                                                                                                                                                                                                                                                                                     | CLASSIFICATION OF THE APPLICATION (Int.CLS)    |
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| -/-                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                       |                                                |
| The present search report has been drawn up for all claims                                                                                                                                                            |                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                       |                                                |
| Place of search<br>THE HAGUE                                                                                                                                                                                          |                                                                                                                                                                                                                                                           | Date of completion of the search<br>8 October 2002                                                                                                                                                                                                                                                                                                                    | Examiner<br>Zeisler, P                         |
| CATEGORY OF CITED DOCUMENTS                                                                                                                                                                                           |                                                                                                                                                                                                                                                           | T: theory or principle underlying the invention<br>E: earlier patent document, but published on, or<br>after the filing date<br>D: document cited in the application<br>L: document cited for other reasons<br>A: technological background<br>O: non-written disclosure<br>P: intermediate document<br>&: member of the same patent family, corresponding<br>document |                                                |
| X: particularly relevant if taken alone<br>Y: particularly relevant if combined with another<br>document of the same category<br>A: technological background<br>O: non-written disclosure<br>P: intermediate document |                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                       |                                                |

EPO FORM 1503 (03.02.92) (P.2/3)



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#### CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

- ☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

#### LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- ☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- ☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.
- ☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
- ☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:



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## EUROPEAN SEARCH REPORT

Application Number

EP 02 00 9643

| DOCUMENTS CONSIDERED TO BE RELEVANT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                        |                                                           |                                            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|--------------------------------------------|
| Category                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Citation of document with indication, where appropriate, of relevant passages                                                                                                          | Relevant to claim                                         | CLASSIFICATION OF THE APPLICATION (IntCL5) |
| P, X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | PATENT ABSTRACTS OF JAPAN<br>vol. 016, no. 521 (E-1285),<br>27 October 1992 (1992-10-27)<br>-& JP 04 196263 A (MITSUBISHI ELECTRIC<br>CORP), 16 July 1992 (1992-07-16)<br>* abstract * | 1-4, 7                                                    |                                            |
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| The present search report has been drawn up for all claims                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                        |                                                           |                                            |
| Place of search<br><b>THE HAGUE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                        | Date of completion of the search<br><b>8 October 2002</b> | Examiner<br><b>Zeisler, P</b>              |
| <p><b>CATEGORY OF CITED DOCUMENTS</b></p> <p>X : particularly relevant if taken alone<br/>Y : particularly relevant if combined with another document of the same category<br/>A : technological background<br/>O : non-written disclosure<br/>P : intermediate document</p> <p>T : theory or principle underlying the invention<br/>E : earlier patent document, but published on, or after the filing date<br/>D : document cited in the application<br/>L : document cited for other reasons<br/>&amp; : member of the same patent family, corresponding document</p> |                                                                                                                                                                                        |                                                           |                                            |

EPC FORM 1503 03/92 (P/C/CH)



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**LACK OF UNITY OF INVENTION**  
**SHEET B**

Application Number

EP 02 00 9643

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

**1. Claims: 1-8**

Compression bonding first and second integrated circuits

**2. Claims: 9-11**

Method of information processing through vertical  
transmission paths

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 02 00 9643

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on  
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08-10-2002

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